

# Unpronounced Heads in Relative Clauses\*

Uli Sauerland

*Tübingen University*

## 1 Introduction

The analysis of English relative clauses is the subject of a long-standing debate. (Lees 1960, 1961, Chomsky 1965, Kuroda 1968, Schachter 1973, Vergnaud 1974, Heim 1987, Kayne 1994, Borsley 1997, Grosu and Landman 1998, Hackl and Nissenbaum 1998, Bianchi (1995), and others) Consider the example (1): The question is whether the head of the relative clause—*pandas* in (1)—stands in a transformational relationship to the relative clause internal argument position occupied by a trace. Though some of the literature also

---

\*I would like to thank Noam Chomsky, Danny Fox, Daniel Hardt, Chris Kennedy, Winfried Lechner, Jon Nissenbaum and the editors for giving me very useful comments on the work presented in this paper. This work was presented in a class at Tübingen University in Winter 1999/2000, at the Second Asian GLOW conference at Nanzan University, and at a workshop on relative clauses at Tel Aviv University, I am grateful to the audiences at these venues for their feedback. I gratefully acknowledge the financial support of a postdoctoral fellowship of the Japanese Society for the Promotion of Science and the hospitality of Kanda University during the 1998/99 academic year when many parts of this paper were initially written.

views the determiner *the* as part of the head, really the central question of the debate is the transformational relation of head and relative clause internal trace.

- (1)    The   pandas   that we saw *t* at Ueno were cute.  
                   ⏟                  ⏟  
                   head (NP)        relative clause

Both possible positions—that there’s a transformational relationship and that there isn’t—received support. The latter position, Carlson (1977) calls the *Matching Hypothesis*: it claims that there’s no direct transformational relationship between the head NP and the relative clause internal trace position. Instead an phonologically empty operator raises from the relative clause internal position to the initial position of the relative clause, and mediates the semantic relationship between the relative clause internal position and the head. The other position—that there’s a transformational relationship—together with the generally held assumption that Movement is the only transformational rule amounts to the *Raising Hypothesis*: The head NP (or sometimes DP) starts out in the relative clause internal position, and moves to its surface position.

## 1.1 Contributions of this paper

A lot of recent work on the syntax and semantics of movement relationships has focussed on properties of reconstruction (Chomsky 1993, Fox 1998, 1999a, Freidin 1986, Heycock 1995, Huang 1993, Lebeaux 1988, 1992, 1998, Sauerland 1998, Takano 1995, and others).

This has led to a better understanding of the properties of movement and a refined concept of reconstruction. This paper attempts to apply these diagnostics to relative clauses, in the hope of shedding new light on the question of the transformational relationship. Based on the study of reconstruction properties, I argue for the following three results.

The first result is that Carlson's (1977) claim that both raising and matching relative clauses exist in English (also Heim 1987 and Grosu and Landman 1998) is supported by evidence from reconstruction in English. However, I also argue that the distinction is drawn along slightly different lines from what Carlson (1977) proposes. For example, antecedent contained deletion will be necessarily some form of a raising relative according to my analysis.

The second result I argue for is that matching relatives just like raising relatives have a complex internal head. For raising relatives, this is expected, since the external head is by hypothesis moved from a relative clause internal position. For matching relatives, however, this result is puzzling, since here the external head didn't move from a relative clause internal position. The presence of an internal copy of the head argues for some grammatical relationship between the trace position and the external head even in matching relative clauses.

My third result concerns the nature of the relationship of the silent internal head and the external head in matching relative clauses. I observe here that research on comparatives (Bresnan 1973, 1975, Lechner 1999) has revealed a similar finding: an internal copy of



relative clause internal *wh*-movement takes place in both structures. However, the NP *pandas* doesn't move to the external head position in (2b). Rather, the relative clause external head position is filled by some NP that's a different token from the internal head. However, a special relationship between the two NPs must be satisfied—that of relative/comparative deletion. This relationship, forces phonological deletion of the NP in the relative clause internal position. Moreover, the antecedent licensing this deletion must be the external NP, where I assume that ellipsis licensing requires identity of meaning as first discussed by Sag (1976) (see also Tancredi 1992, Fox 1999b, and Merchant 1999). (2b) is also pronounced as (1), since again lower copies in movement chains aren't pronounced, and furthermore PF-deletion of the instance of *pandas* in the relative clause internal chain head is forced by the relative deletion proposal.

This paper raises a number of questions about the syntax and semantics of relative clauses: For example, some of these concern the interpretation of relative clauses. In the conclusions I outline some of the issues that arise, and point at possible solutions to these questions. However, at present, I often don't know good evidence that would favor one analysis over another.

## 2 Matching and Raising Relatives

In this section, I aim to show that the reconstruction behavior of the relative clause head argues for Carlson's (1977) claim that relative clauses are ambiguous between raising and matching relative clauses. The basic contrast leading to this claim is that the head doesn't show Condition C reconstruction, but allows reconstruction for Condition A and variable binding (Munn 1994:402).<sup>2</sup>

- (3)    a. The relative of John<sub>i</sub> that he<sub>i</sub> likes lives far away.  
      b. The relative of his<sub>i</sub> that everybody<sub>i</sub> likes lives far away.

### 2.1 Reconstruction in Wh-Movement

Before addressing reconstruction properties in relative clauses, this section summarizes some of the literature on reconstruction in *wh*-movement. My goal is to demonstrate that reconstruction here is a well-described phenomenon (Freidin 1986, Heycock 1995, Huang

---

<sup>2</sup>There seems to be some interesting speaker variation concerning variable binding in relative clauses. Daniel Hardt (p.c.) points out that (3b) is ungrammatical for him. He also dislikes example (i) from the literature, and finds (ib) slightly degraded. At present, I have no analysis of this variation to offer.

- (i)        The picture of himself which every student hated annoyed his friends. (Sharvit 1999:(8a))  
  
(ii)      The relative of his every man loves most is his mother.

1993, Lebeaux 1988, 1992, 1998, Takano 1995) and that it can be understood quite well on the basis of the copy theory of movement (Chomsky 1993, 1999a, 2000a, Sauerland 1998). This literature summary is by no means exhaustive, but rather focusses selectively on the phenomena relevant for the later sections.

One property of *wh*-movement that has been discovered is that reconstruction of the moved NP with its arguments is obligatory. Only the determiner and modifiers adjoined to the NP need not reconstruct. This is demonstrated by (4) and (5). In (4a), the R-expression *John* is part of the argument of *argument* and therefore induces a Condition C violation with the pronominal *he* that c-commands the trace position of *wh*-movement. In (4b), the relative clause containing *John* is a modifier to the noun *argument*, and therefore doesn't induce a Condition C violation in the trace position.

- (4)    a. \*[Which argument that John<sub>i</sub> was wrong]<sub>j</sub> did he<sub>i</sub> accept *t<sub>j</sub>* in the end?  
           b. [Which argument that John<sub>i</sub> had criticized]<sub>j</sub> did he<sub>i</sub> accept *t<sub>j</sub>* in the end?

The contrast in (5) makes the same point, but shows more pointedly that only the position of the R-expression *John* in the *wh*-phrase determines whether it triggers a Condition C violation or not.

- (5)    a. \*[Which argument of John<sub>i</sub>'s that Mary had criticized]<sub>j</sub> did he<sub>i</sub> omit *t<sub>j</sub>* in the final version?

- b. [Which argument of Mary's that John<sub>i</sub> had criticized]<sub>j</sub> did he<sub>i</sub> omit *t<sub>j</sub>* in the final version?

Taking Condition C as a diagnostic for the position of an R-expression at LF, the LF-structure of a *wh*-chain as revealed by reconstruction is sketched in (6). I use the terms *core NP* and *modifiers* to distinguish between the lowest NP-segment of the NP-complement of the Wh-Determiner, and all modifiers adjoined to this NP. In the example (5a), the core NP would be *argument of John's*, while the only modifier is the relative clause *that Mary had criticized*.

$$(6) \quad \underbrace{\text{Wh-Determiner (core NP) modifiers}}_{\text{Spec of CP}} \dots \underbrace{\text{core NP}}_{\text{trace}}$$

Diagram (6) says that the core NP must occur in the lowest position of a *wh*-movement chain. Modifiers, however, need not. Since modifiers must though be interpreted somewhere, I assume that they must occur in the position of the *wh*-determiner. For the core NP, it is unclear from the arguments above whether it also occurs in the higher position of a *wh*-chain. Following Fox (1999a), I will assume that it does.

A second factor has been shown to affect the LF-position of modifiers. Namely, a bound variable pronoun in the *wh*-moved constituent forces reconstruction to a position where the bound variable is c-commanded by its antecedent. So in (7), the relative clause



modifying *paper* must be represented in the trace position  $t_i$  at LF, where it is c-commanded by *every student*.

- (7) [Which paper that  $he_j$  wrote] $_i$  did every student $_j$  plan to revise  $t_i$ ?

The evidence for the reconstruction of bound variables is Lebeaux's (1992) observation that Variable Binding and Condition C Reconstruction go hand-in-hand (see also Lebeaux 1998, Fox 1999a, Fox 2000a). Hence, a violation of Condition C is observed in (8): Binding of the pronoun  $he_k$  requires representation of the constituent containing *he* in the trace position  $t_i$ . But in that position, the R-expression is c-commanded by *she*, and therefore Condition C blocks coreference of these two expressions.

- (8) \*[Which paper that  $he_k$  gave to Bresnan $_j$ ] $_i$  did *she $_j$*  think that every student $_k$  would like  $t_i$ ? Lebeaux (1998:(123b))

## 2.2 Reconstruction of Relative Clause Internal Material

In the domain of relative clauses, material that is pied-piped internal to the relative clause behaves exactly like the moved material in *wh*-questions. This observation is, as far as I know, due to Safir (1999). (9) and (10) show that this material exhibits an argument/adjunct distinction just like *wh*-movement.

Consider first (9).<sup>3</sup> The difference between (9a) and (9b) is that in (9a) the R-expression *John* is part of a prepositional phrase modifying the phrase *whose picture*, while in (9b) the R-expression is part of an argument of the same phrase (cf. Safir 1999:(30a)).

- (9) a. There's a singer whose picture in John<sub>i</sub>'s office he<sub>i</sub>'s very proud of. (Safir 1998:(34b))
- b. \*There's a singer whose picture of John<sub>i</sub>'s office he<sub>i</sub>'s very proud of.

The contrast in (10) shows essentially the same as the one in (9) under the assumption the prenominal genitive in (10a) is a modifier of the noun *description* (cf. also Safir 1999:(28)).

- (10) a. Max is a prince John<sub>i</sub>'s description of whom he<sub>i</sub> varies when spies are around. (Safir 1998:(34c))
- b. \*Max is a prince whose description of John<sub>i</sub> he<sub>i</sub> varies when spies are around.

Hence, I conclude that whatever is said about the reconstruction of *wh*-movement in questions carries over directly to movement of the relative clause operator in a relative clause.

---

<sup>3</sup>Several examples in this paper are drawn from the manuscript (Safir 1998), which are not included in the final paper (Safir 1999). However, Safir (p.c.) reports that the reason for omitting these data were not the judgements, and I have independently checked the judgements reported in Safir's draft paper with several native speakers.

### 2.3 Reconstruction of the Relative Clause Head

The external head of a relative clause, however, exhibits a different behavior. The head of the relative clause displays the ambiguous behavior already illustrated by (3) above: Reconstruction effects seem to be absent with respect to Condition C, while other tests for reconstruction show that it must be possible.

Consider first Condition C. It's well known that an R-expression in the head of a relative clause doesn't trigger a Condition C effect in the relative clause internal trace position, even when it's an argument as in (11).

- (11) The relative of John<sub>i</sub> that he<sub>i</sub> likes *t* lives far away.

The following minimal pairs establish that there's a difference between the head of a relative clause and *wh*-movement with respect to Condition C. The examples (12a), (13a), and (14a) all show that material of the head of a relative clause doesn't trigger a Condition C effect in the trace position. The corresponding examples in (12b), (13b), and (14b) establish that, for *wh*-movement, a Condition C effect is observed under the same circumstances.<sup>4</sup>

---

<sup>4</sup>As is the case for most judgements on Condition C with reconstruction, speakers vary in how strong the effect is perceived to be (compared to Condition C effect with surface c-command). What matters for the argument here is the contrast between the a and b examples, and the judgements indicated refer to the contrast.

- (12) a. Which is the picture of John<sub>i</sub> that he<sub>i</sub> likes?  
 b. \*Which picture of John<sub>i</sub> does he<sub>i</sub> like?
- (13) a. The pictures of Marsden<sub>i</sub> which he<sub>i</sub> displays prominently are generally the attractive ones.(Safir 1998:(38a))  
 b. \*Which pictures of Marsden<sub>i</sub> does he<sub>i</sub> display prominently?
- (14) a. I have a report on Bob's division he won't like.(Merchant 1998:fn.1)  
 b. \*Which report on Bob<sub>i</sub>'s division will he<sub>i</sub> not like?

There is also a difference between the relative clause head and material pied-piped internal to the relative clause with respect to Condition C reconstruction. This is shown by (15): (15a) is a case where material pied-piped internal to the relative clause triggers Condition C. (15b) shows that the an R-expression in relative clause head doesn't trigger Condition C.

- (15) a. \*I respect any writer whose depiction of John<sub>i</sub> he<sub>i</sub>'ll object to. (Safir 1998:34a)  
 b. I respect any depiction of John<sub>i</sub> he<sub>i</sub>'ll object to.

The facts from Condition C reconstruction are a challenge to the view that relative clauses allow only the raising analysis. On this view, all relative clauses would be derived by movement of the head from a relative clause internal position. Therefore, relative clause

heads would be predicted to behave exactly like other cases of *wh*-movement with respect to reconstruction. But, this prediction seems incorrect if the facts in (12) to (15) are correct. Therefore, I conclude that at least the raising analysis of relative clauses cannot be the only analysis possible for relative clauses. Safir (1999:609–614), who discusses reconstruction into relative clauses and in questions in detail, reaches the opposite conclusion. He cautions that *wh*-movement in questions in some examples doesn't seem to exhibit a perceivable Condition C reconstruction effect (cf. Kuno (1997), Lasnik (1998)), and therefore the generalization about Condition C reconstruction in *wh*-questions might be more than the core NP vs. modifier distinction of Freidin (1986) and Lebeaux (1988). However, the argument I made here shouldn't be affected by Safir's concern: Since the contrast between the head of relative clauses and cases of movement is observed in minimal pairs ((12) to (15)) it is unlikely to be due to some mysterious general property of reconstruction, and therefore should be explained as a difference between relative clause heads and all other cases of movement. Therefore, I conclude that some analysis other than the raising analysis must be possible for relative clauses.<sup>5</sup>

Now consider arguments that have been given in favor of assuming the raising anal-

---

<sup>5</sup>Fox (2000b) points out another argument for a matching analysis of relative clauses. Namely, the assumption that late merger of relative clauses are merged late (Lebeaux 1988, Chomsky 1993) is incompatible with the raising analysis because the relative clause head is merged into the structure before the relative clause itself on this analysis. Given the independent support for the late merger of relative clauses, this amounts to an argument for a non-raising analysis of relative clauses.

ysis of relative clauses to be possible. These are cases where the relative clause head must be interpreted only in an internal position. One such case is binding, as already mentioned in (3). (16a) and (16b) are two examples from the literature, (16c) shows that also a bound variable pronoun in the relative clause head can be bound by a quantifier in the relative clause.<sup>6</sup>

- (16) a. The interest in each other<sub>i</sub> that John and Mary<sub>i</sub> showed *t* was fleeting. (Schachter 1973:43a)
- b. Une photo de lui<sub>i</sub> que Jean<sub>i</sub> avait donnée à Marie a été retrouvée  
A photo of him that John has given to Mary has been found again  
hier. (Vergnaud 1974:256)  
yesterday
- c. The book on her<sub>i</sub> desk (John found out) every professor<sub>i</sub> liked best *t* concerned model theory.

A second kind of evidence in favor of reconstruction of the relative clause head comes from idiom chunk interpretation. Schachter (1973) attributes this argument to Brame (1968),

---

<sup>6</sup>Interestingly, many speakers find (16c) degraded when the quantifier binding into the relative clause head is more deeply embedded. Possibly, this is related to the suggestion I make in 5 that such examples involve QR of the quantifier to a position outside of the relative clause and the observation that such quantifier movement often seems to be clause-bound. However, also not all speakers find (16) with deeper embedding unacceptable. The effect might plausibly also be a parsing difficulty.

which I was unable to consult. The fact is that the relative clause head can be part of an idiom chunk with material surrounding the trace. In (17), this is exemplified using the idiom chunks *make headway* and *take pictures*.

- (17) a. The headway John made proved insufficient.  
b. All the pictures John took showed the baby.

This argument based on idiom chunks is in fact more decisive than the one based on binding: For binding, for example Sternefeld (1998) and Sharvit (1999) develop a semantic mechanism that can bring about binding relationships in the absence of c-command. However, the particular mechanism proposed could not bring about idiom chunk interpretation and, I suspect, for principled reasons could not since the parts of the idiom chunk can't be assigned an interpretation independent of each other which is then brought together by a semantic mechanism.

A third case where the relative clause head seems to be interpreted internally is scope interpretation in (18). Namely, it seems that the relative clause head can take scope in a position internal to the relative clause.<sup>7</sup>


- (18) a. No linguist would read the many books Gina will need for vet school. (need >> many)

---


<sup>7</sup>See Heim (1987) and Bhatt (2000) for more discussion concerning the scope of the relative clause head.

- b. Mary shouldn't even have the few drinks that she can take. (can  $\gg$  few)

We're therefore led to the conclusion that in some cases the head must be interpreted internal to the relative clause, but not in other cases. A potential *Matching Structure* is illustrated in (19). Internal to the relative clause an empty operator undergoes movement, and creates semantically an open  $\lambda$ -predicate. This is then intersected with the predicate the head expresses.

- (19) a. the picture of John<sub>i</sub> he<sub>i</sub> likes  
 b. the picture of John<sub>i</sub>  $\lambda x$  he<sub>i</sub> likes  $t_x$  (*matching*)
- 
- A horizontal line with an upward-pointing arrow at its left end connects the variable  $t_x$  to the  $\lambda x$  operator.

A potential *Raising Structure* is illustrated in (20). Here, the head of the relative clause itself starts out in the relative clause internal position. It moves to the head position, where it also is pronounced. At LF, however, the head is interpreted only in the relative clause internal position, where the variable expressed by *himself* is bound.

- (20) a. the picture of himself everybody likes  
 b. the *Op* everybody<sub>i</sub> likes [picture of himself<sub>i</sub>] (*raising*)
- 
- A horizontal line with an upward-pointing arrow at its left end connects the *Op* operator to the head of the relative clause [picture of himself<sub>i</sub>].

The interpretation of a structure like (20) is by no means straightforward. I take up this question in Section 5. Since my main interest in this paper, however, is the matching



structure, it will be sufficient to keep a vague paraphrase of the interpretation intended with representation (20b) in mind. For (20a), such a paraphrase is *the function that maps everybody to a picture of himself that he likes*.

## 2.4 Condition C with Raising Relatives

In the previous section I argued that both the raising and matching analysis are required in the analysis of English relative clauses. To explain the obviation of Condition C, I invoked the matching analysis, while I invoked the raising analysis to explain the possibility of binding. The claimed structural ambiguity predicts that Condition C effects should be observed when the raising analysis is forced. This section demonstrates that this prediction is borne out. I show that each of the three factors which I claimed to require the raising analysis induces a Condition C violation when the relevant test is constructed.

First consider variable binding. In all examples in (21) and (22), variable binding forces the raising analysis, because the pronoun *her* is bound by the quantifier *every girl* only in the relative clause internal position. In the examples (21a) and (22a) the relative clause head contain an R-expression in addition to the bound variable. Furthermore, a pronoun c-commands the trace position in the relative clause. The fact that this pronoun cannot be coreferent with the R-expression in the relative clause head, I claim is due to a violation of Condition C. This is corroborated by the absence of such an effect in (21b) and (22b), where R-expression and pronominal are interchanged.

- (21) a. \*The letters by John<sub>j</sub> to her<sub>i</sub> that he<sub>j</sub> told every girl<sub>i</sub> to burn were published.  
 b. The letters by him<sub>j</sub> to her<sub>i</sub> that John<sub>j</sub> told every girl<sub>i</sub> to burn were published.
- (22) a. \*A review of John<sub>i</sub>'s debate with her<sub>j</sub> that he<sub>i</sub> wanted every senator<sub>j</sub> to read landed in the garbage instead.  
 b. A review of his<sub>i</sub>'s debate with her<sub>j</sub> that John<sub>i</sub> wanted every senator<sub>j</sub> to read landed in the garbage instead.

This result, of course, resembles Lebeaux's (1992) observation concerning questions in (8) above. One question that I will put aside here is whether reconstruction to intermediate positions in a relative clause can be established. Sauerland (1998) presents one datum that I take to support reconstruction to intermediate positions. From the point of view of the raising vs. matching dichotomy, such cases would have to be analyzed as raising followed by matching in an intermediate position.

The use of idioms is another way to enforce the raising analysis. As Munn (1994) already observes, the prediction that Condition C effects reemerge is borne out. This is shown by the pairs in (23) and (24). In (23), the idiom chunk *take picture* requires the noun *pictures* to be interpreted in the trace position inside of the relative clause. Therefore, the Condition C violation triggered by the R-expression *Bill* in this position in (23a) is expected. Again, (23b) shows that coreference is possible when R-expression and pronominal

element are exchanged.<sup>8</sup>

(23) a. \*the picture of Bill<sub>i</sub> that he<sub>i</sub> took (Munn 1994:(15c))

b. the picture of himself<sub>i</sub> that Bill<sub>i</sub> took

The contrast in (24) is analogous to that in (23). Again, material in the head triggers a violation of Condition C in (24a) confirming the claim that, on the raising analysis, Condition C violations are observed in relative clauses. (24b) provides the relevant contrast, when R-expression and pronoun are exchanged.

(24) a. \*The headway on Mary<sub>i</sub>'s project she<sub>i</sub> had made pleased the boss.

b. The headway on her<sub>i</sub> project Mary<sub>i</sub> had made pleased the boss.

The third way of forcing the raising analysis was the narrow scope interpretation of material in the relative clause head. In (25), I show that narrow scope of *many* in (25a) and *few* in (25b) seems to cause a Condition C effect in the expected fashion.

---

<sup>8</sup>Possibly, a Condition C effect in (23) is expected independently of whether *take a picture* is an idiom chunk or not. Namely, Chomsky (1986:167) suggests that the noun *picture* in similar sentences obligatorily takes an implicit pronominal as its agent argument which refers to the creator of the picture. This implicit pronominal could trigger the Condition C effect in (23).

- (25) a. \*The many books for Gina<sub>i</sub>'s vet school that she<sub>i</sub> needs will be expensive. (need  
 >> many)
- b. \*The few coins from Bill<sub>i</sub>'s pocket he<sub>i</sub> could spare weren't enough for all the  
 needy. (could >> few)

Carlson (1977) and Heim (1987) argue that there are other properties that correlate with the raising vs. matching distinction. In particular, they argue that only a raising analysis is possible if the relative clause internal trace appears in a *there*-existential construction. The data in (26) and (27) indicate that a correlation with Condition C is again confirmed.

- (26) a. ??I visited all the relatives of Mary<sub>i</sub>'s that she<sub>i</sub> said there are *t* left.  
 b. I visited all the relatives of her<sub>i</sub>'s that Mary<sub>i</sub> said there are *t* left.
- (27) a. \*It would have taken us all year to read the letters for John<sub>j</sub> he<sub>j</sub> expected there  
 would be.  
 b. It would have taken us all year to read the letters for him<sub>j</sub> John<sub>j</sub> expected there  
 would be.

Finally, Carlson (1977) and Grosu and Landman (1998) point out that a raising analysis seems to be impossible when the head of the relative clause is the complement of

an indefinite determiner. Therefore, variable binding is expected to be impossible with an indefinite determiner. This prediction is corroborated by the contrast in (28):<sup>9</sup>

- (28) a. (The/Nearly every) picture of herself<sub>i</sub> every girl<sub>i</sub> sent angered the teacher.  
 b. ??(A/One picture) of herself<sub>i</sub> every girl<sub>i</sub> sent angered the teacher.

The correlation between definiteness and the possibility of the matching analysis is also corroborated by (29), where the head of the relative clause appears in a context that only allows an existential reading. The proposed correlation predicts that variable binding is ruled out in (29), and that therefore the example is ungrammatical.

- (29) \*On the table, there's (a/one) picture of herself every girl sent.

Taken together the facts in this section lend strong support to the claimed structural ambiguity of relative clauses. We have seen that the obviation of Condition C is not observed once the raising analysis of a relative clause is forced by either binding, idiom inter-

---

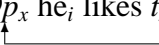
<sup>9</sup>Ruys (2000:527–28) observes the contrast in (i) and that is similar to the one in (28). If we assume that (ib) requires a matching structure of the relative clause, the ill-formedness of (ia) would indeed be expected.

- (i) a. ??Some woman that every boy<sub>i</sub> loved came out to save him<sub>i</sub>  
 b. The very woman that every boy<sub>i</sub> loved most came out to save him<sub>i</sub>

pretation, or scope. Therefore, the absence of Condition C effects in other relative clauses cannot be explained based on the raising analysis. Therefore, both analyses—the raising and the matching analysis—are needed. For the rest of the paper, I say nothing more about the raising analysis. For the matching analysis, however, I argue that the analysis proposed above needs to be modified.

### 3 The Internal Head in Matching Relatives

The straightforward account of Matching Relatives, already mentioned in (19), would be to assume that an empty  $\lambda$ -operator binds the trace position as sketched in (30b).

- (30) a. the picture of John<sub>i</sub> he<sub>i</sub> likes  
 b. the picture of John<sub>i</sub>  $Op_x$  he<sub>i</sub> likes  $t_x$  (*matching*)
- 

In this section, I present two arguments that there's a more complex representation of the external head in the internal position.

#### 3.1 Double Headed ACD

The first argument draws on facts and an analysis of Sauerland (1998, Sauerland (2000)) concerning a particular English construction, which I call here *Double Headed Antecedent*

*Contained Deletion*, or shorter *Double Headed ACD*. I present the argument here in a abbreviated form.

First recall that ACD is a form of VP-ellipsis inside of a relative clause where the relative clause head seems to be part of the antecedent VP. As illustrated by (31), the structure of ACD is such that the apparent antecedent of the elided VP contains the elided VP itself.

- (31) Polly visited every town  $\overbrace{\text{Eric did } \langle \text{visit } t \rangle}^{\text{elided VP}}$ .  
⏟  
antecedent

Sag (1976), Larson and May (1990), and Kennedy (1997a) strongly argue that ACD is resolved by invisible A-bar movement—quantifier raising—of a DP containing the relative clause. Therefore, (32) is the LF-representation of (31).

- (32) [every town,  $Op_y$   $\overbrace{\text{Eric visited } [y]}^{\text{elided VP}}$ ]  $\lambda x$  Polly  $\overbrace{\text{visited } [x]}^{\text{antecedent}}$   
↑  
↑

In standard examples of ACD like (31) the head of the ACD-relative is also the DP that undergoes quantifier raising. However, this identity of the two DPs isn't a necessary feature of the construction. If the two DPs are different, I call this construction *Double Headed ACD*. Double headed ACD is in many cases ungrammatical (Kennedy 1994), as illustrated by (33a). However, (33b) is grammatical. The difference between (33a) and

(33b) is that, in (33a), the head nouns of the two DPs involved in double headed ACD, the head of the relative clause and the DP that undergoes quantifier raising, are different, while they're identical in (33b). In Sauerland (1998), I show that more generally double headed ACD is acceptable if the lowest NP-segments of the two DPs involved are identical (or at least very similar), but not otherwise. Of course, single headed ACD of the type illustrated by (31) always satisfies this identity requirement, because the head of the relative clause is identical to the DP that undergoes quantifier raising.

- (33) a. \*Polly visited every town that's near the lake Eric did  $\langle \text{visit } t \rangle$ . (Kennedy 1994)  
 b. Polly visited every town that's near the town Eric did  $\langle \text{visit } t \rangle$ .

The contrast (33) follows from the structure for ACD proposed in Merchant (1998) and Sauerland (1998), and sketched in (34) for (33a) and the general identity requirement on VP-ellipsis. Consider the two trace positions in (34), the trace internal to the relative clause is marked as  $[y, \text{lake}]$  and the trace left by quantifier raising is marked as  $[x, \text{town}]$ . Since one of the traces is part of the elided VP while the other is part of the antecedent, we expect that the identity requirement on ellipsis allows ellipsis in (34) if and only if the content of the two trace positions is identical. If both trace positions have the content shown, this predicts ellipsis to be possible only when the content of the two traces is identical.

- (34) \*every  $[\lambda x \ x \text{ is near the lake } [\lambda y \text{ Eric visited } [y, \text{lake}]]]$   $\lambda x$  Polly visited  $[x, \text{town}]$ .



But, the prediction only arises if the relative clause internal trace position has as its content the material of the relative clause head. If the relative clause internal position could be contentless in externally headed relatives, the examples in (33) should all have the same status. In this way the paradigm in (33) argues for the assumption that some material of the relative clause head is represented in the relative clause internal trace position even in the case of matching relative clauses.

The identity requirement found in double headed ACD is not found in all cases of an elided VP containing a trace where the binders of the trace and the corresponding trace in the antecedent of the elided phrase differ in their lexical content. Both examples in (35) show this. In Sauerland (1998), I argue that independent factors, in particular sloppy readings and focus, obviate the identity requirement in such cases.

- (35) a. I know which cities Mary visited, but I have no idea which lakes she did.  
       b. The cities Mary visited are near the lakes Bill did.

### 3.2 Crossover

The second argument is based on the contrast in (36) from Safir (1998). He observes that a quantifier in the head of the relative can only bind a relative clause internal pronoun if the pronoun is c-commanded by the RC-internal trace in (36). So, the quantifier *anyone* in (36a) cannot bind the pronoun *he* in (36a), but in (36b) the binding relation is possible.

- (36) a. \*Pictures of anyone<sub>i</sub> which he<sub>i</sub> displays prominently are likely to be attractive ones. (Safir 1999:(66a))
- b. Picture of anyone<sub>i</sub> that put him<sub>i</sub> in a good light are likely to be attractive ones.

Example (37) corroborates Safir's empirical claim. In (37), the quantifier *every boy* occurs in the relative clause head. It cannot bind the pronoun *he* in (37a) where the relative clause internal trace occupies the object position and therefore doesn't c-command the pronoun. In (37b), however, the relative clause internal trace occupies the subject position and therefore binding of the pronoun is possible—or at least, only a violation of the Weak Crossover Constraint.

- (37) a. \*Mary exhibited the picture of every boy<sub>i</sub> that he<sub>i</sub>/his<sub>i</sub> sister brought.
- b. Mary exhibited the picture of every boy<sub>i</sub> that was brought by him<sub>i</sub>/his<sub>i</sub> sister.

The contrast in (38) shows that even when a matching relative is forced by Condition C a contrast like in (36) is observed:

- (38) a. \*The Times will generally publish pictures of any woman<sub>i</sub> visiting Clinton<sub>j</sub> that he<sub>j</sub> told her<sub>i</sub> about.
- b. The Times will generally publish pictures of any woman<sub>i</sub> visiting Clinton<sub>j</sub> that he<sub>j</sub> thinks will offend her<sub>i</sub>.

As Safir also notes, the matching analysis with an empty internal head doesn't predict these contrasts. Consider the representation in (39) for (36a). This representation takes into account that the quantifier *anyone* must be moved out of the relative clause head and adjoined to the clausal level to be interpretable. This has been suggested for inverse linking by May (1977) and recent work of myself has found empirical support for this assumption (Sauerland 1999).

(39) \* $\text{anyone}_x \left[ \text{pictures of } t_x \text{ which}_y \text{ he}_x \text{ displays prominently } t_y \right]$  are likely to be attractive ones.

In the representation (39), the quantifier *anyone* c-commands the pronoun and therefore binding should in principle be possible. The grammaticality of (39) is predicted to be comparable to other cases of inverse linking where the inversely linked quantifier binds into the matrix clause. But in fact, (36a) is worse.

The contrast in (39) is, of course, reminiscent of similar contrasts with *wh*-movement, as Safir also observes who uses the term secondary strong crossover for these constructions. (40) shows that the *wh*-phrase *whom* cannot bind a pronoun that c-commands the trace of the bigger *wh*-phrase in (40a), while it can bind the pronoun in (40b).

- (40) a. \*Which picture of  $\text{whom}_i$  does  $\text{he}_i$  display prominently?  
 b. Which picture of  $\text{whom}_i$  puts  $\text{him}_i$  in a good light?

Assuming the copy theory of movement, the ungrammaticality of (40a) is a strong crossover effect or equivalently following Chomsky (1981) a Condition C effect: In the representation (41) for (40a), the unbound *wh*-trace  $t_y$  is c-commanded by  $he_y$ .

(41) whom  $\lambda y$  which  $\lambda x$  does  $he_y$  display [ $x$ , picture of  $t_y$ ] prominently

It's desirable to reduce the ungrammaticality of (36a) to Condition C in the same way as was done for (40a). But, this requires the extension of the copy theory to matching relative clauses in some way. If we copy the external head of the relative clause into the internal position, the same explanation is available for Safir's contrast.

(42) \* $anyone_x$  [pictures of  $t_x$  which  $y$   $he_x$  displays prominently [ $y$ , pictures of  $t_x$ ]] are likely to be attractive ones.

In (42),  $he_x$  c-commands the QR-trace  $t_x$  in the relative clause. Therefore, (42) violates Condition C just like (41) does.

However, this solution seems to undermine the motivation for the matching analysis. The observation that led me to propose that the matching analysis is available for relative clauses in addition to the raising analysis was the absence of Condition C effects. If we now adopt the explanation of the ungrammaticality of (36a) as a Condition C vio-

lation based on the representation (42), we *prima facie* predict Condition C violations to occur more generally.

In the next section, I show how this paradox is resolved. I'll argue that the relationship between the internal and external copy of the relative clause head in representation (42) actually allows slight modifications, which obviate Condition C exactly in the cases where it's in fact obviated.

## 4 Relative Deletion

### 4.1 The Proposal

The relationship of head and the relative clause internal trace position cannot be a direct movement relationship, because that wouldn't distinguish matching from raising relative clauses. I therefore propose that the material in the trace position is related to the head not by movement, but by ellipsis. More precisely, I propose that the material internal to the relative clause argued for in the previous section is an elided copy of the material in the external position.

To exemplify the proposal look at (43). The relative clause in (43a), I propose, receives the matching analysis in (43b): A silent copy of the head *book* is the complement of the relative clause operator *which* as shown in (43b). At LF, therefore this copy is represented in the relative clause internal trace position.

(43) a. the book which Susi likes

b. the book which <book> Susi likes *t*  
          antecedent           elided NP

The ellipsis process hypothesized is quite different from VP-ellipsis. One respect in which it's different is that ellipsis of the NP in (43) is obligatory, while VP-ellipsis is an optional process. A second difference is that the antecedent of the silent internal head in (43) must be the external head of the relative clause. For VP-ellipsis sites, however, any other VP in the discourse can serve as the antecedent.

While the hypothesized ellipsis differs substantially from VP-ellipsis, there is another ellipsis process that behaves very much like the ellipsis postulated in (43): Comparative Deletion. Bresnan (1973, 1975) and Lechner (1999) argue that comparative clauses involve obligatory deletion of an AP or NP. Specifically, the AP or NP is obligatorily deleted that contains the trace of the comparative operator. Consider for examples the comparative clause in (44): according to Bresnan's proposal the subject position of the *than*-clause in (44) is occupied by a silent copy of the NP *a long whale*. However, this silent copy cannot be pronounced in (44). Hence, comparative deletion is obligatory exactly like the hypothesized ellipsis in (43).

(44) Ahab saw a longer whale than (\*a long whale) was ever seen.

Furthermore, Williams (1977:102) and Kennedy (1997b) show that, in (45), the antecedent of comparative deletion must be the phrase that is the sister of the comparative operator  $Op_d$ . Hence, an interpretation of the comparative deletion site as *wide* isn't available in (45). Again, comparative deletion behaves exactly like the ellipsis postulated in (43).

- (45) The table is wider than this rug is, but this rug is longer  $Op_d$  than the desk is  $\langle d, \text{long} \rangle / * \langle d, \text{wide} \rangle$  (Kennedy 1997b:154)

I introduce therefore the term *Relative Deletion* to refer to the process that renders the internal head of matching relatives unpronounceable.

- (46) **Relative Deletion:** In matching relatives, the internal head must not be pronounced. Furthermore, the external head must be the antecedent of the internal head.

Lechner (1999) develops an interesting proposal to account for comparative deletion. His idea is that it involves movement without chain formation. As far as I can see, his proposal can also be adopted to relative deletion, but I leave this for future research.

## 4.2 Vehicle Change

In this section, I show that the proposed relative deletion solves the problem noted at the end of section 3.2. To recall the problem, consider (47). (47) shows the apparent conflict

between the Condition C evidence and the crossover evidence above. The motivation of the matching analysis was to explain the absence of Condition C effects in examples like (47a), but in section 3.2 I argued that the matching analysis must then be modified to account for the appearance of strong crossover effects as in (47). To explain (47b), I proposed that the head of the relative clause is in fact represented in the relative clause internal position in matching relatives. This seems to predict that (47a) should violate Condition C.

- (47) a. Pictures of John<sub>i</sub> which he<sub>i</sub> displays prominently are likely to be attractive ones.  
       b. \*Pictures of anyone<sub>i</sub> which he<sub>i</sub> displays prominently are likely to be attractive ones.

In fact, though, the contrast in (47) is predicted by the proposal that the internal head is an elided copy of the external head. The reason is that ellipsis processes have been argued by Fiengo and May (1994) to allow what they call *vehicle change*. Specifically, Fiengo and May (1994) argue that an R-expression or wh-trace in the antecedent of ellipsis can correspond to a pronoun in the elided material. One piece of evidence for this proposal are data like (48). In (48a) and (48b), the antecedent of the elided VP contains an R-expression. However, only (48a) doesn't allow coreference between the pronominal subject of the elided VP and this R-expression.

- (48) a. \*John likes Mary<sub>i</sub> and she<sub>i</sub> does ⟨like her<sub>i</sub>⟩, too.



- b. John likes the story about Mary<sub>i</sub> and she<sub>i</sub> knows he does ⟨like the story about her<sub>i</sub>⟩.

The difference between (48a) and (48b) is how deeply embedded the R-expression is in the antecedent VP. Fiengo and May (1994) argue that Condition B rather than Condition C determines the possibility of coreference in (49). This follows if the R-expression in the antecedent can correspond to a pronominal in the elided VP. The kind of correspondence relation, Fiengo and May (1994) refer to as vehicle change.

I show now that vehicle change is at work in comparative and relative deletion as well, and explains the problem mentioned above. The presence of vehicle change corroborates the proposal that ellipsis of the internal head takes place in matching relatives.

Consider first the contrast in (49). It shows that vehicle change is observed with comparative deletion. Again, both (49a) and (49b), contain an R-expression in the antecedent of the ellipsis: the comparative AP and a coreferent pronoun c-commands the ellipsis site. In (49a) where coreference between the pronoun *he* and the position of the R-expression in the ellipsis is blocked by Condition B and C, coreference is in fact blocked. In (49b), however, where Condition B is not violated, coreference is possible. This is exactly the pattern predicted by vehicle change.

- (49) a. \*Mary is more proud of John<sub>i</sub> than he<sub>i</sub> is ⟨proud of John<sub>i</sub>/him<sub>i</sub>⟩. (Lechner 1999)

- b. Mary is more proud of John<sub>i</sub> than he<sub>i</sub> thinks she is ⟨proud of John<sub>i</sub>/him<sub>i</sub>⟩.

To explain the absence of Condition C effects in matching relatives, I propose that vehicle change of an NP to an NP-anaphor is also possible. Consider (50) under this assumption. If the internal head of the matching relative clause is a *one*-anaphor referring to the predicate *picture of John* is possible as indicated in (50b), no violation of Condition C is expected.

- (50) a. pictures of John<sub>i</sub> which he<sub>i</sub> displays prominently  
 b. [picture of John<sub>i</sub>]<sub>j</sub> λx which he<sub>i</sub> displays [x, one<sub>j</sub>]

What does vehicle change predict for the crossover example Safir's (1998)? Consider the relevant part of structure in (51a) (repeated from (36a)). In this example, vehicle change to a *one*-anaphor is blocked. The reason is that the external head contains a variable: it's the NP *pictures of x*. But, there is no constant relation a NP-anaphor could refer to that's coreferent with the external head-NP *pictures of x*. Hence, in (51a) vehicle change of the entire NP to an NP-anaphor is blocked.

- (51) a. \*pictures of anyone<sub>i</sub> which he<sub>i</sub> displays prominently  
 b. \*anyone λx [pictures of [x] [which ] λy he<sub>x</sub> displays prominently [y, picture of [x]]]

Consider now vehicle change of the trace  $[x]$  to a pronoun. This is predicted to be possible in (51). But, it would not change the status of (51a), however, since the resulting representation would still cause a weak violation of Condition B as shown by (52), even though Condition C wouldn't be violated.<sup>10</sup>

(52) ??John<sub>i</sub> displays a picture of him<sub>i</sub>

However, the possibility of this vehicle change predicts that if the trace is more deeply embedded in the antecedent, such that Condition B isn't violated, the example should become grammatical. The contrast (53) shows that the crossover effect triggered by the internal head exhibits the locality of Condition B. While (53a) doesn't allow *every boy* to bind *he*, binding is possible in (53b), where the quantifier *every boy* is more deeply embedded in the head of the relative clause.

---

<sup>10</sup>There's disagreement in the literature as to whether (52) is a Condition B violation. For example, Haegeman (1991:212) gives the contrast in (i), and ties it to Condition B (see also Fiengo and Higginbotham 1981:401-02).

- (i) a. \*Poirot<sub>i</sub> believes any description of him<sub>i</sub>.
- b. Poirot<sub>i</sub> believes Miss Marple's description of him<sub>i</sub>.

Reinhart and Reuland (1993:(8)) claim that for similar examples both a reflexive and a pronoun are acceptable. My informants generally found an effect in (52) and (i), though the effect was weaker than a Condition B effect when the antecedent and the pronoun are coarguments of a verb.

- (53) a. \*Mary exhibited the picture of every boy<sub>i</sub> that he<sub>i</sub> brought.  
b. Mary exhibited the picture of every boy<sub>i</sub>'s mother that he<sub>i</sub> brought.

Note that the locality restriction exhibited in (53) exactly matches Condition B: While coreference of subject and the pronoun *him* is impossible in (54a), it's allowed in (54b).

- (54) a. \*John<sub>i</sub> brought a picture of him<sub>i</sub>.  
b. John<sub>i</sub> brought a picture of his<sub>i</sub> mother.

## 5 Conclusions

In this paper, I provided new arguments for the claim of Carlson (1977) that there are two structures for relative clauses: the matching and the raising structure (see also Heim (1987), Grosu and Landman (1998), Bhatt (2000)). The difference between the two structures is that on the raising structure the relative clause head is moved to its surface position from a relative clause internal position, while on the matching structure it's not. I furthermore argued that the structure of matching relative clauses involves a silent internal head, that is phonologically deleted by an operation akin to comparative deletion.

The work presented here leads to further question about the syntax and semantics of relative clauses. The matching structure of relative clauses hypothesized above raises questions similar to those that have been raised for comparative deletion. By assumption

both of these operations involve an PF-deletion operation, just as ellipsis does. In particular, one of the arguments in section 4.2 above was drawn from parallels between ellipsis and relative/comparative deletion with respect to the identity of unpronounced material to the antecedent. However, while ellipsis is an optional processes, relative and comparative deletion must be obligatory in most cases. In this respect, the two processes exhibit a behavior more like movement, where also a copy of parts of the moved phrase must not be pronounced. Therefore, an important question for this analysis is how this difference arises? While I cannot answer this question here, I believe that recent work by Lechner (1999) might lead to an account. Lechner (1999) develops an analysis that assigns to comparative deletion a status on which it is predicted to share some properties with ellipsis, but others with movement.

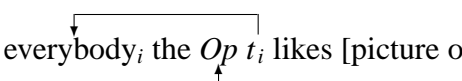
The most important question for the analysis of raising relatives is an understanding of their semantics. If my arguments in section 2 are correct, the head of a raising relative clause must be interpreted in a relative clause internal position. Heim (1987), Bhatt (2000), Hackl and Nissenbaum (1998), and Grosu and Landman (1998) present proposals for the interpretation of several cases of matching relative clauses. However, none of these proposals is intended for the cases like (55) (repeated from (20)), where a relative clause internal quantifier binds a pronoun in the head of the relative clause.

(55) the picture of himself<sub>i</sub> everybody<sub>i</sub> likes

Sharvit (1996) and Sharvit (1999) is the most comprehensive proposal concerning the interpretation of such structures I'm aware of. She points out that, in sentences like (56), the relative clause internal quantifier that binds a pronominal in the relative clause head can also bind a pronoun in the object position of the matrix clause.

(56) The picture of himself<sub>*i*</sub> everybody likes is gracing his<sub>*i*</sub> homepage.

Variable binding as in (56) would be expected if the raising analysis of relative clauses allowed quantifier raising to take place from a relative clause internal position to a position above the head of the relative clause. Such a structure is shown for (56) in (57).

(57)  everybody<sub>*i*</sub> the *Op* *t*<sub>*i*</sub> likes [picture of himself<sub>*i*</sub>] is gracing his<sub>*i*</sub> homepage

On the basis of a structures like (57), an account of the interpretation of raising relatives with a bound variable in head is easier than for the structure in (20) above. The interpretive mechanisms required to account for (57) would be the same as those required for (58). But, (58) doesn't require any special assumptions about the semantics of reconstruction since all pronouns bound by *everybody* are in its scope.

(58) For everybody: The picture of himself that he likes best is gracing his homepage.

Sharvit argues against this analysis. Her main argument is that quantifier raising to a position outside of a relative clause should be blocked by island constraints. At present, I'm not in a position to answer Sharvit's objections to the quantifier raising analysis properly. But, one possible line to pursue would be to assume that only matching relative clauses are not islands for quantifier raising.

## References

- Bhatt, Rajesh. 2000. Adjectival modifiers and the raising analysis of relative clauses. In *Proceedings of NELS 30*, ed. by M. Hirotani, 159–173. Amherst, Mass., GLSA.
- Bianchi, Valentina. 1995. *Consequences of Antisymmetry for the Syntax of Headed Relative Clauses*. Ph.D. dissertation, Scuola Normale Superiore, Pisa, Italy.
- Borsley, Robert D. 1997. Relative clauses and the theory of phrase structure. *Linguistic Inquiry* 28.629–647.
- Brame, Michael K. 1968. A new analysis of the relative clause: Evidence for an interpretive theory. Unpublished Manuscript, MIT.
- Bresnan, Joan. 1973. Syntax of the comparative clause construction in English. *Linguistic Inquiry* 4.275–343.
- . 1975. Comparative deletion and constraints on transformations. *Linguistic Analysis* 1.25–74.
- Carlson, Greg N. 1977. Amount relatives. *Language* 58.520–542.
- Chomsky, Noam. 1965. *Aspects of the Theory of Syntax*. Cambridge, Mass.: MIT Press.
- . 1981. *Lectures on Government and Binding: The Pisa Lectures*. Berlin: Mouton de Gruyter.
- . 1986. *Knowledge of Language*. New York: Praeger.
- . 1993. A minimalist program for linguistic theory. In *The View from Building 20, Essays in Linguistics in Honor of Sylvain Bromberger*, ed. by K. Hale and J. Keyser, 1–52. MIT Press.
- Fiengo, Robert, and James Higginbotham. 1981. Opacity in NP. *Linguistic Analysis* 7.395–421.
- Fiengo, Robert, and Robert May. 1994. *Indices and Identity*. Cambridge, Mass.: MIT Press.
- Fox, Danny. 1998. *Economy and Semantic Interpretation*. Ph.D. dissertation, Massachusetts Institute of Technology, Cambridge, Mass.
- . 1999a. Reconstruction, variable binding and the interpretation of chains. *Linguistic Inquiry* 30.157–196.

- . 1999b. Focus, parallelism, and accomodation. In *Proceedings of SALT 9*, ed. by T. Matthews and D. Strolovitch, 70–90. Ithaca, N.Y., Cornell University, CLC Publications.
- . 2000a. *Economy and Semantic Interpretation*. Cambridge, Mass.: MIT Press.
- . 2000b. Antecedent contained deletion and the copy theory of movement. Manuscript, Harvard University, Cambridge, Mass.
- Freidin, Robert. 1986. Fundamental issues in the theory of binding. In *Studies in the Acquisition of Anaphora, Volume I*, ed. by B. Lust, 151–188. Dordrecht, Netherlands: Reidel.
- Grosu, Alexander, and Fred Landman. 1998. Strange relatives of the third kind. *Natural Language Semantics* 6.125–170.
- Hackl, Martin, and Jon Nissenbaum. 1998. Variable modal force in *for*-infinitival relative clauses. Manuscript, Massachusetts Institute of Technology, Cambridge, Mass.
- Haegeman, Liliane. 1991. *Introduction to Government and Binding Theory*. Number 1 in Blackwell Textbooks in Linguistics. Cambridge, Mass.: Blackwell.
- Heim, Irene. 1987. Where does the definiteness restriction apply? Evidence from the definiteness of variables. In *The Representation of (In)definiteness*, ed. by E. Reuland and A. ter Meulen, chapter 2, 21–42. Cambridge, Mass.: MIT Press.
- Heycock, Caroline. 1995. Asymmetries in reconstruction. *Linguistic Inquiry* 26.547–570.
- Huang, C.T. James. 1993. Reconstruction and the structure of VP: Some theoretical consequences. *Linguistic Inquiry* 24.103–138.
- Kayne, Richard S. 1994. *The Antisymmetry of Syntax*. Cambridge, Mass.: MIT Press.
- Kennedy, Christopher. 1994. Argument contained ellipsis. Linguistics Research Center Report LRC-94-03, University of California, Santa Cruz.
- . 1997a. Antecedent-contained deletion and the syntax of quantification. *Linguistic Inquiry* 28.662–688.
- . 1997b. *Projecting the Adjective: The Syntax and Semantics of Gradability and Comparison*. Ph.D. dissertation, University of California, Santa Cruz.
- Kuno, Susumo. 1997. Binding theory in the minimalist program. Manuscript, Harvard University, Cambridge, Mass.
- Kuroda, S.-Y. 1968. English relativization and a certain related problem. *Language* 44.244–266.
- Larson, Richard K., and Robert May. 1990. Antecedent containment or vacuous movement: Reply to Baltin. *Linguistic Inquiry* 21.103–122.
- Lasnik, Howard. 1998. Some reconstruction riddles. In *Proceeding of the Penn Linguistics Colloquium*, Philadelphia, University of Pennsylvania.
- Lebeaux, David. 1988. *Language Acquisition and the Form of Grammar*. Ph.D. dissertation, University of Massachusetts, Amherst.
- . 1992. Relative clauses, licensing, and the nature of the derivation. In *Perspectives on*



- Phrase Structure: Heads and Licensing*, ed. by S. Rothstein and M. Speas, volume 25 of *Syntax and Semantics*, 209–239. New York: Academic Press.
- . 1998. Where does the binding theory apply? (version 2). Technical Report 98-044, NEC Research Institute, Princeton, New Jersey.
- Lechner, Winfried. 1999. *Comparatives and DP-structure*. Ph.D. dissertation, University of Massachusetts, Amherst.
- Lees, Robert B. 1960. *The Grammar of English Nominalizations*. The Hague: Mouton.
- . 1961. The constituent structure of noun phrases. *American Speech* 36.159–168.
- May, Robert. 1977. *The Grammar of Quantification*. Ph.D. dissertation, Massachusetts Institute of Technology, Cambridge, Mass.
- Merchant, Jason. 1998. On the extent of trace deletion in ACD. Manuscript, University of Utrecht, Netherlands and University of California, Santa Cruz.
- . 1999. *The Syntax of Silence: Sluicing, Islands, and Identity in Ellipsis*. Ph.D. dissertation, University of California, Santa Cruz.
- Munn, Alan. 1994. A minimalist account of reconstruction asymmetries. In *Proceedings of NELS 24*, ed. by M. González, 397–410. Amherst, University of Massachusetts, GLSA.
- Reinhart, Tanya, and Eric Reuland. 1993. Reflexivity. *Linguistic Inquiry* 24.657–720.
- Ruys, Eddie. 2000. Weak crossover as a scope phenomenon. *Linguistic Inquiry* 31.513–539.
- Safir, Ken. 1998. Reconstruction and bound anaphora: Copy theory without deletion at LF. Manuscript, Rutgers University, New Brunswick, New Jersey.
- . 1999. Vehicle change and reconstruction in A-bar chains. *Linguistic Inquiry* 30.587–620.
- Sag, Ivan. 1976. *Deletion and Logical Form*. Ph.D. dissertation, Massachusetts Institute of Technology, Cambridge, Mass.
- Sauerland, Uli. 1998. *The Meaning of Chains*. Ph.D. dissertation, Massachusetts Institute of Technology, Cambridge, Mass.
- . 1999. Relativized minimality effects with quantifier raising. Paper presented at ESCOL '99, University of Connecticut, Storrs.
- . 2000. Obligatory reconstruction and the meaning of traces. Technical Report 160, Sonderforschungsbereich 340, Universität Tübingen, Tübingen.
- Schachter, Paul. 1973. Focus and relativization. *Language* 49.19–46.
- Sharvit, Yael. 1996. *The Syntax and Semantics of Functional Relative Clauses*. Ph.D. dissertation, Rutgers University, New Brunswick, New Jersey.
- . 1999. Functional relative clauses. *Linguistics and Philosophy* 22.447–478.
- Sternefeld, Wolfgang. 1998. The semantics of reconstruction and connectivity. Arbeitspapier 97, SFB 340, Universität Tübingen and Universität Stuttgart, Germany.
- Takano, Yuji. 1995. Predicate fronting and internal subjects. *Linguistic Inquiry* 26.327–340.

- Tancredi, Christopher. 1992. *Deletion, Deaccenting and Presupposition*. Ph.D. dissertation, Massachusetts Institute of Technology, Cambridge, Mass.
- Vergnaud, Jean Roger. 1974. *French Relative Clauses*. Ph.D. dissertation, Massachusetts Institute of Technology, Cambridge, Mass.
- Williams, Edwin. 1977. Discourse and logical form. *Linguistic Inquiry* 8.101–139.